



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of

SUGA

Atty. Ref.: 925-203

Serial No. 09/898,082

Group: 2815

Filed: July 5, 2001

Examiner: Nguyen, Joseph H.

For: SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING
THE DEVICE

* * * * *

September 2, 2003

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REPLY BRIEF

This is in response to the Examiner's Answer dated July 3, 2003. It is respectfully submitted that the Examiner's Answer is incorrect for at least the following reasons.

A. Claim Grouping in Examiner's Answer Is Wrong

In its Appeal Brief, Appellant divided the appealed claims into the following separate and distinct groups A through F, each of which stands/falls on its own:

- A. Claims 20, 22 and 24.
- B. Claim 21.
- C. Claim 23.
- D. Claims 1, 3, 4, 7 and 9.
- E. Claim 5.

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F. Claims 6 and 8.

The reasons why each of the aforesaid groups stands/falls on its own independent of the other groups are set forth in the Appeal Brief where each group is discussed. It can be seen on pages 5-14 of the Appeal Brief that each claim group is discussed separately, and includes different limitations.

The Examiner's Answer has improperly ignored Appellant's claim groupings. The Examiner's Answer states that "Appellant's brief includes a statement that claims 1, 3-9, 20-24 stand or fall together." This allegation in the Examiner's Answer is wrong. Appellant's Appeal Brief contains no such statement. In contrast, Appellant's Appeal Brief contains a statement that the claims are broken into the separate and distinct groupings outlined above – the exact opposite of what the Examiner's Answer contends. Thus, it is clear that the Examiner's Answer has mischaracterized Appellant's Appeal Brief.

In view of the above, it is respectfully submitted that the claim groupings provided in Appellant's Appeal Brief are correct and should be adhered to.

B. Examiner's Arguments re Claim 20 Lack Merit

The claims clearly define over the art of record for the reasons set forth in the Appeal Brief, which is incorporated herein by reference. Arguments with respect to all claims will not be repeated herein. However, for purposes of example only, the Examiner's error with respect to claim 20 will be discussed below.

Claim 20 requires "a first substrate supporting a first insulating layer with a contact hole defined therein, and a first conductive material filling in the contact hole in

the first insulating layer and protruding above a surface of the first insulating layer; a second substrate supporting a second insulating layer with a contact hole defined therein, and a second conductive material filling in the contact hole in the second insulating layer; and wherein the first conductive material that fills in the contact hole in the first insulating layer and the second conductive material that fills in the contact hole in the second insulating layer are solid-state-bonded to each other so as to contact one another in a bonded state." The word "contact" means touching. For example, see Fig. 4 of the instant application which illustrates that the conductive material 5 in contact hole 13 of insulating layer 7 is solid-state-bonded to and contacts the conductive material 25 provided in through hole 28 of the other insulating layer 27. Moreover, Figs. 3-4 of the instant application illustrate that the conductive materials 5 and 25 each protrude above their corresponding insulating layers 7 and 27, respectively.

The Examiner's Answer admits that in Kawai the Cu material which fills opposed through holes 4 in Kawai is not directly bonded to each other and thus is in *non-touching* relation. Nonetheless, the Examiner's Answer contends that they "contact" one another. However, as previously pointed out, Kawai's requirement of tin bonding members 5 and metal wirings 2 means that in Kawai the Cu material which fills opposed through holes 4 in Kawai is not directly bonded to each other and thus is in non-contacting relation. In other words, in direct contrast with the requirement of claim 20, in Kawai the conductive materials in different holes 4 are not in contact with one another. Bonding members 5 and metal wirings 2 prevent such conductive materials in holes 4 from contacting one another in Kawai – teaching directly away from the invention of claim 20.

As discussed above, the word "contact" means touching. The well known and established meaning of the word "contact" is a requirement, especially when viewed in light of the instant specification. In embodiments of this invention, the conductive regions are securely and/or directly bonded *directly* to each other even though the dishing portions may have been initially provided in these conductive regions. There is absolutely nothing in the instant specification which suggests that the word "contact" as used in the claims means anything other than touching.

The Examiner's argument that "contact" does not mean touching is illogical and defies the clear and well known meaning of the word "contact." The Examiner's interpretation of the claimed word "contact" is not reasonable, and is contrary to the disclosure of the instant specification.

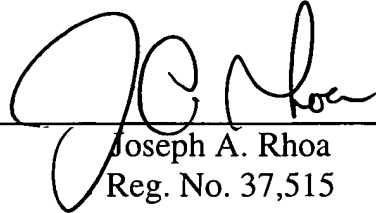
Furthermore, Fig. 12(c) of Kawai also fails to disclose or suggest the requirement of claim 20 of a "first conductive material filling in the contact hole in the first insulating layer and protruding above a surface of the first insulating layer." In Fig. 12(c) of Kawai, Cu (copper) in a hole 4 is not "protruding above" a surface of a corresponding insulating layer 1. Instead, the top surface of Cu material in a hole 4 is flush with the top surface of insulating layer 1. The Examiner's Answer appears to contend that Sn (tin) members 5 meet this requirement of claim 20. However, it cannot be said that Sn bonding members 5 meet this aspect of claim 20, because Sn bonding members 5 are not the material filling a contact hole as required by claim 20 (Sn and Cu are clearly different materials). Again, Kawai is entirely unrelated to the invention of claim 20 in this respect.

It is respectfully submitted that the final rejection should be reversed.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____

A handwritten signature in black ink, appearing to read "J. Rhoa", is written over a horizontal line.

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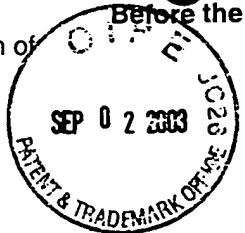
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Serial No. 09/898,082

Filed: July 5, 2001

Title: SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING THE DEVICE



C# M#
Group Art Unit: 2815

Examiner: Nguyen, Joseph H.

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Sir:

☐ Correspondence Address Indication Form Attached.

☐ **NOTICE OF APPEAL**

Applicant hereby appeals to the Board of Appeals from the decision dated _____ of the Examiner twice/finally rejecting claims _____ (\$ 320.00)

☐ An appeal **BRIEF** is attached in triplicate in the pending appeal of the above-identified application (\$ 320.00) \$ 0.00

☐ Credit for fees paid in prior appeal without decision on merits \$ ()

☒ A reply brief is attached in triplicate under Rule 193(b) (no fee)

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s) (\$110.00/1 month; \$410.00/2 months; \$930.00/3 months; \$1450.00/4 months) \$
SUBTOTAL \$ 0.00

☐ Applicant claims "Small entity" status, enter 1/2 of subtotal and subtract \$ ()
☐ "Small entity" statement attached. SUBTOTAL \$ 0.00

Less month extension previously paid on \$ (0.00)

XX Other: Request for Oral Hearing attached hereto. TOTAL FEE ENCLOSED \$ 0.00

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140**. A duplicate copy of this sheet is attached.

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Signature: